UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/712,512	11/13/2003	Pavel Holub	80045	8931

47601 7590 12/14/2006

RESOLUTION SPECIALTY MATERIALS LLC
1600 SMITH STREET, 24TH FLOOR
P. O. BOX 4500
HOUSTON, TX 77210-4500

EXAMINER	
SANDERS, KRIELLION ANTIONETTE	

ART UNIT	PAPER NUMBER
1714	

DATE MAILED: 12/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/712,512	HOLUB ET AL.	
	Examiner	Art Unit	
	Kriellion A. Sanders	1714	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 September 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9/27/06 has been entered.

Claim Rejections - 35 USC § 102

The rejections are repeated for reasons of record.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-3, 5-9 and 11- 19 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Desor et al, US Patent No. 6005042.

Applicant's invention pertains to an aqueous dispersion having a film formation temperature of 50 degrees or less comprising a multi-stage emulsion polymer produced in two free-radical emulsion polymerization stages of a monomer mixture of:

1. 80-99.5% by weight of ethylenically unsaturated non-ionic monomers and at least 0.5% by weight of additional ethylenically unsaturated monomers selected from the group consisting of:

2. Weak acid monomers
3. Strong acid monomers, such as phosphoethyl methacrylate
4. Keto group-containing monomers, such as diacetone acrylamide or acetoxyethyl methacrylate or allyl acetoacetate.

wherein the glass transition stage of the first polymerization stage is at least 50 degrees C. and

wherein the glass transition stage of the second polymerization stage is -30 to 10 degrees C. and wherein the second stage comprises 0.5 to 10 wt% of each of a **strong acid** monomer and a **keto group-containing** monomer.

The composition may also include one of the following:

a. A molecule containing multiple -NH_2 functionality
b. A molecule containing multiple –NH- functionality
c. A polyfunctional carboxylic hydrazide containg at least two hydrazide groups.such as adipic dihydride

Desor et al, '042 discloses A polymer dispersion having a minimum film-forming temperature in the range of from 0 to 40.degree. C., which is prepared by stepwise emulsion polymerization comprising:

Polymerizing in a first stage a monomer composition I comprising:

From 50 to 68.5% by weight
A. of monomers A whose homopolymers have a glass transition temperature (Tg) below 0 degree. C.
B. from 30 to 50% by weight of monomers B whose homopolymers have a glass transition temperature (Tg) above 65 degree C.

C. from 0.5 to 5% by weight of alpha, beta-unsaturated carboxylic acids and/or carboxamides C which are copolymerizable with A and B;

D. from 1 to 7.5% by weight of ethylenically unsaturated monomers D containing keto groups; and

E. from 0 to 10% by weight of other ethylenically unsaturated monomers E which do not contain a nitrogen atom.

whereby the weight percentages in each case are based on the overall amount of the monomers used in the first stage to form polymer I.

Subsequently polymerizing in a second stage a monomer composition II comprising:

From 5 to 45% by weight

A. of monomers A' whose homopolymers have a glass transition temperature (Tg) below 0 degree C.

B. from 65 to 95% by weight of monomers B' whose homopolymers have a glass transition temperature (Tg) above 65 degree C.

C. from 0 to 4% by weight of alpha, beta-unsaturated carboxylic acids and/or carboxamides C' which are copolymerizable with A' and B'

D. from 0 to 5% by weight of ethylenically unsaturated monomers D' containing keto groups; and

E. from 0 to 10% by weight of other ethylenically unsaturated monomers E' which do not contain a nitrogen atom.

The process of step-wise emulsion polymerization as set forth in the patent is carried out by first emulsifying and polymerizing the monomer composition I of the first stage in an aqueous phase in the presence of emulsifiers, initiators and, if desired, protective colloids, at suitable temperatures of, for example from 60 to 95.degree. C. and subsequently polymerizing the monomer composition II of the second stage in the

presence of the polymerized composition I, at suitable temperatures of, for example, from 60.degree C. to 95.degree C., via initiators.

Examples of monomer A and A' include C1 -C12 -alkyl esters of acrylic acid or C5 -C12 -alkyl esters of methacrylic acid, for example butyl acrylate, n-octyl acrylate and 2-ethylhexyl acrylate. The monomers A are preferably used in the monomer composition I in a range of from 50 to 68.5% by weight, and more preferably, from 55 to 60% by weight, based on the weight of the overall amount of the polymer in monomer composition I. Monomers A' also are preferably used in monomer composition II in a range of from 5 to 45% by weight, and more preferably, from 15 to 30% by weight, based on the weight of the overall amount of the polymer in monomer composition II.

Suitable monomers B and B' include styrene, vinyltoluene, acrylonitrile, methacrylonitrile and also C1 -C4 -alkyl esters or cycloalkyl esters of methacrylic acid, for example methyl methacrylate, cyclohexyl methacrylate, isobomyl methacrylate and tert-butyl methacrylate. These monomers B are preferably used in monomer composition I in a range of from 30 to 50% by weight, and more preferably, from 35 to 45% by weight, based on the weight of the overall amount of the polymer in monomer composition I. Monomers B' also are preferably used in monomer composition II in a range of from 65 to 95% by weight, and more preferably, from 75 to 85% by weight, based on the weight of the overall amount of the polymer in monomer composition II.

Suitable monomers D and D' include those having 3 to 8 carbon atoms, for example acrylic acid, methacrylic acid, itaconic acid, acrylamide and methacrylamide. Suitable ethylenically unsaturated monomers D (and D') containing keto groups are, preferably, monomers containing acetoacetoxy groups, for example acetoacetoxyethyl

methacrylate, acetoacetoxybutyl methacrylate, acrylamidomethylacetylacetone and vinyl acetoacetate, polymerizable derivatives of diacetone, for example diacetoneacrylamide and diacetonemethacrylamide, and butanonemethacrylic esters. Monomers D are preferably used in monomer composition I in a range of from 1 to 7.5% by weight, and more preferably, from 2 to 4% by weight, based on the weight of the overall amount of the polymer in monomer composition I. Monomers D' also are preferably used in monomer composition II in a range of

Ethylenically unsaturated monomers E (and E') that can be incorporated, if desired, by copolymerization are, preferably, hydroxyalkyl (meth)acrylates, glycidyl (meth)acrylates, alkoxyvinylsilanes and (meth)acryloyloxyalkylsilanes. Monomers E are preferably used in monomer composition I in a range of from 0 to 10% by weight, and more preferably, from 3 to 7% by weight, based on the weight of the overall amount of the polymer in monomer composition I. Monomers E' also are preferably used in monomer composition II in a range of from 0 to 10% by weight, and more preferably, from 3 to 7% by weight, based on the weight of the overall amount of the polymer in monomer composition II.

Patentee indicates that the chemical resistance of the dispersions may be increased by including polyfunctional carboxylic hydrazides, in the dispersions. The hydrazides should contain at least two hydrazide groups in the molecule, examples being adipic dihydrazide, oxalic dihydrazide, isophthalic dihydrazide and polyacrylic polyhydrazide. The ratio of hydrazide groups to keto groups incorporated in the polymer by way of monomers D preferably is from 0.5:1 to 1:0.5, and in particular is an equimolar ratio.

The patented invention may include ionic emulsifiers. These ionic emulsifiers may include primarily anionic emulsifiers. These anionic emulsifiers may comprise the alkali metal or ammonium salts of alkyl-, aryl- or alkylaryl-sulfonates or of alkyl, aryl or alkylaryl sulfates, phosphates or phosphonates, whereby it also is possible for oligo- or polyethylene oxide units to be located between the hydrocarbon radical and the anionic group. Typical examples include sodium lauryl sulfate, sodium undecylglycol ether sulfate, sodium octylphenol glycol ether sulfate, sodium dodecylbenzene sulfonate, sodium lauryldiglycol sulfate, and ammonium tri-tert-butylphenol-penta- or -octaglycol sulfate from 0 to 5% by weight, and more preferably, from 1 to 3% by weight, based on the weight of the overall amount of the polymer in monomer composition II. These emulsifiers are considered to be "strong acid monomers", in the presently used sense of the word.

See col. 1, line 54 through col. 4, line 63.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Desor et al, US Patent No. 6005042 as applied to claims 1-3, 5-9 and 11- 19 above, and further in view of Gray et al, US Patent No. 6875834.

The patented invention to Desor et al, "042 differs from applicant's invention primarily in that it does not include the specific "strong acid monomers of applicant's claims.

Gray et al discloses protective coatings that have enhanced durability (such as detergent resistance), yet also have easy removability (such as during stripping operations). These coatings are prepared from two-component polymer compositions based on using (A) a first polymer containing reactive functional groups with a selected level of carboxylic acid functionality and (B) post-crosslinking with a polyfunctional crosslinker agent containing functional groups that are reactive with the appropriate functional groups of the first polymer. The selected level of acid functionality in the first polymer unexpectedly provides the combination of durability and ready removability of the final coating after curing. The polymers used as polymer (A) of the present invention contain, as polymerized units, from 5 to 50%, of one or more monoethylenically unsaturated monomers containing an acidic functional group selected from one or more of carboxylic, sulfonic and phosphonic groups. monoethylenically unsaturated monomers containing sulfonic acid or phosphonic groups include, for example, 2-acrylamido-2-methyl-1-propane-sulfonic acid, 2-methacrylamido-2-methyl-1-propanesulfonic acid, 3-methacryl-amido-2-hydroxypropanesulfonic acid, allylsulfonic acid, methallylsulfonic acid, allyloxybenzenesulfonic acid, methallyloxybenzenesulfonic acid, 2-hydroxy-3-(2-propenyloxy)propanesulfonic acid, 2-methyl-2-propene-1-sulfonic

acid, styrene-sulfonic acid, vinylsulfonic acid, 2-sulphoethyl methacrylate, 3-sulfopropyl acrylate, 3-sulfopropyl methacrylate, sulfomethyl acrylamide, sulfomethyl methacrylamide and ***phosphoethyl methacrylate***.

The acid functionality level of polymer A controls the ease of removability of dried films (for example, a polish film) based on using the post-crosslinked polymer compositions of the present invention. Patentee teaches that acid levels of greater than 15% up to 25% are particularly preferred to enhance film removal and ease of film removal properties of the two-component coating compositions of the present invention in floor test evaluations. Polymer A may be selected from solution, dispersion and ***emulsion*** polymers; preferably polymer A is an ***emulsion*** polymer.

Polymer B includes pendant functional groups such as carbodiimide, aziridinyl or epoxy groups, the backbone polymer may be based on any suitable vinyl monomer carrying the corresponding functional group (such as glycidyl methacrylate) or reactive group that is capable of post reacting to attach the carbodiimide, aziridinyl or epoxy group. See col. 1 line 54 through col. 9, line 11.

Because Gray et al teaches the advantageous properties of enhanced durability (such as detergent resistance), and easy removability attributable to the "strong acid monomers" that are copolymerized with the additional ethylenically unsaturated monomers set forth in the patent, it would have been obvious to one of ordinary skill in the art at the time of applicant's invention to include an acidic monomer such as ***phosphoethyl methacrylate*** in the monomeric compositions of Desor et al, 042', to achieve enhanced durability and improved removability in the resulting polymeric coating compositions. Applicant indicates that a primary objective of his invention is the

obtainment of enhanced chemical resistance of the presently claimed coating compositions. Such properties are taught by Gray et al to be readily attributable to the acidic monomers disclosed by patentee.

Response to Arguments

Applicant's arguments filed 9/27/06 have been fully considered but they are not persuasive. Applicant finds all outstanding rejections to be improper on the basis that Desor et al requires a first soft polymerization stage followed by a second hard polymerization stage, whereas in the presently claimed application these stages are reversed. Applicant suggests that the comparative examples in the specification are sufficient to persuade of unexpected results that are attributable to the sequence of the polymerization stages. Particular;y, applicant refers in particular, to comparative example 3. Applicant's argument has not been found to be persuasive because applicant's claims are directed to an aqueous dispersion comprising a multi-stage emulsion polymer. The aqueous dispersion of Desor et al is considered to be equivalent to that of applicant's claims even though it may have been derived by a different process. Applicant has not clearly shown in a commensurate manner that the dispersion of the present invention is different from that of Desor et al and that such difference is attributable to a reversion of the process stages involved. Applicant's comparative data is not commensurate in scope with the present claims in that the data does not present a representative sampling of mmonomeric mixtures for eaxh of the phase I and phase II polymerizations. The

examiner maintains that the process of Dresor et al would provide a product that is essentially the same as applicant's claimed dispersions.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kriellion A. Sanders whose telephone number is 571-272-1122. The examiner can normally be reached on Monday through Thursday 8:30am-7:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Kriellion A. Sanders
Primary Examiner
Art Unit 1714

ks